

# Developing a Model of Task-Based Approach Esp Materials Integrated with Higher Order Thinking Skills

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**Abstract--Teaching English, as a global language, in polytechnic is designed to provide the widest and real learning experience for students to develop their attitudes, skills and knowledge which is needed to build the competencies. To reach the purpose, teaching the main content of English for science and engineering needs to be blended with high order thinking skills. Therefore, supporting learning material is urgent to increase effectiveness of learning. The material should provide adequate learning resource and practice which is designed uniquely following students' learning style and motivation.**

## I. Preliminary

English teaching and learning in Shipbuilding State Polytechnic of Surabaya is designed to reach the target that learners can functionally communicate both orally and written everyday communication as well as professional one. The goal of teaching English for students is to master English to a high level of accuracy and fluency, to encourage them to use the language, to prepare them to reach informational level of literacy which would be used in the context of social, organizational, and professional uses. It means that the English curriculum in polytechnic is designed to provide the widest and real learning experience for students to develop their attitudes, skills and knowledge which is needed to build the competencies. Since English becomes global language [1], a medium for written and oral

communications [2], and lingua franca [3] which is widely adopted by speakers of two different languages for communication, it becomes a must for students to enhance language skills required in learning English. The skills are listening, speaking, reading and writing. Brown [4] categorizes the skills into receptive skills (listening and reading) and productive skills (speaking and writing).

As a vocational education institution, students of Shipbuilding State Polytechnic of Surabaya deal with English for specific purposes (ESPs) which also develop macro-language skills as above mentioned, articulating on speaking in order to facilitate them to make use of English in some communicative events relevant to their workplaces. The micro-language skills of ESP are presented for the students which are embedded in the macro-language skills which articulate on how they are used in discourse of workplaces. In reference to ESPs, according to Richards and Schmidt (2010: 198), ESP is defined as 'a language course or program of pedagogical practices which consist of the content areas and objectives of the course with regard to the fixed specific needs of a particular group of learners'. This relies on the theory that different groups of learners should have specific needs according to their backgrounds. Therefore, Jordan [5] suggested that the



English material should deal with subject-specific materials which are designed according to targeted topics [6].

Considering the teaching and learning characteristics in polytechnic, the learning materials are expected to accommodate students' learning style, allocated time and the learning outcomes. The learning material should cover not only specific engineering contents to discuss but also contents to develop high order thinking skills (HOTS), as it is mentioned in learning outcome statements. This blended material is designed to facilitate students to engage in the process of English language teaching and learning and to enable them to practice thinking skills. In relation to this statement, Putcha [7] strongly urges that when second language learners (SLLs) are accustomed to systematically employing their critical thinking skills, they get positive experiences of learning practices and could encounter any demanding tasks which can in turn establish their own self-confidence to learn English better. In the same spirits, a great number of experts highly recommend that HOTS should be embedded in the process of English language teaching and learning including the development of English textbooks. This relies on theories that HOTS are of great importance for SLLs to establish their own regulated learning strategies [8]. This is supported by empirical evidence which reveals the strengths of teaching critical thinking skills in the process of English language teaching and learning at any level of education [9].

Supporting to the involvement of high order thinking skills in language learning, the ability to think effectively is very important in today's world which is becoming more complex and sophisticated. Higher-order thinking skills are important life skills for people today. With modernization and rapid socio-economic changes, people are called upon to solve various problems and make numerous decisions. Furthermore,

information technology era has also provided the people with countless information at their finger-tips which sometimes are confusing. In addition, the authenticity and validity of this information is also questionable. Thus, people need to exercise their thinking skills in making selection. Moreover, it is widely accepted that most of the educators never deny the importance of teaching higher-order thinking skills to the students so that they would become more critical and analytical thinker.

In line with the characteristics of foreign language teaching and learning in the polytechnic, task-based language teaching (TBLT) approach is selected to optimize limitations on allocated time and students' motivation as well as to reach the prescribed learning outcomes. The approach requires students to explore their learning potential with adequate guidance and direction from teachers. As an ESP material, this is also supported by a learning approach which emphasizes more on textual approach than on contextual approach. Therefore, it is necessary to improve the quality of English learning by maximizing student-centred approach. Wu, Liao and DeBacker [10] had implemented task-based instruction in ESP class in marine engineering English. They found that the approach was effective on students' listening and speaking competency development. On the other hand, most students were satisfied with task-based instruction, and they proposed some feedbacks and suggestions for the task-based instruction in ESP courses which are beneficial for future instruction.

There had been efforts to involve high order thinking skills development in English teaching and learning, especially embedded in teaching macro-skills of language. Juhansar, Pabbajah and Karim [11] reported the implementation of Higher Order Thinking Skills (HOTS) in a classroom practice at university level. They admitted that it brought positive effects to both students and lecturers



although it required more work, time, deeper practical understanding, a number of strategies and practices in the different contexts and situation. HOTS could be applied in the forms questioning and answering the problems critically, arousing students' class participation actively, and accessing the newest information continuously. Other researchers reported the development of HOTS in Malaysia. They [12] reported about promoting HOTS in the tertiary classrooms by the lecturers which showed that a majority of lecturers (60%) always encourage students to find answers to assigned tasks in order to promote HOTS. Brain storming and problem solving are popular activities used in lectures to promote HOTS. The activities are designed to engage higher order thinking skills because students are required to apply their knowledge in such activities. Interactive lectures and project based learning are often used by lecturers to promote HOTS too. The other researchers had reported HOTS module for weak ESL learners [13]. They viewed HOTS as a means to teach writing to weak ESL learners. The findings revealed that the HOTS module served as a guideline for the teachers in applying and integrating thinking skills in the process of teaching writing. These findings were used to guide decisions on implementing the appropriate teaching pedagogy to apply HOTS for teaching writing.

## II. LITERATURE REVIEW

Language learning material which is being developed considers three aspects to be integrated. The aspects which cover English for specific purposes, task-based approach and high order thinking skills are blended well into a learning material. Each aspect may have its specific characteristics to be combined and adjusted to meet the learning outcomes. English content is the dominant aspect. The task-based approach underlays the development of learning material; and the aspect of high order

thinking skills is integrated in developing tasks and activities of learning.

A plethora of definitions and scopes have been suggested in the field of ESP research. It has been defined as teaching of English to the learners who have specific goals and purposes. According to him, these goals might be professional, academic, scientific, etc. which has been asserted that one of the absolute characteristics of his definition identified ESP as being "in contrast to General English". Dudley-Evans [14] gave the definition of ESP that was commonly accepted. Absolute characteristics ESP is defined to meet specific needs of the learners ESP makes use of underlying methodology and activities of the discipline it serves ESP is centred on the language appropriate to these activities in terms of grammar, lexis, register, study skills, discourse, and genre. Variable Characteristics ESP may be related to or designed for specific disciplines ESP may use, in specific teaching situations, a different methodology from that of General English ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level ESP is generally designed for intermediate or advanced students

Task-based Language Learning (TBLL) Task-based language learning has been paid much attention by many researchers since 1980s. Richards and Rodgers [15] claimed, "Task-based language teaching refers to an approach based on the use of tasks as the core unit of planning and instruction in language teaching" [15]. It has been pointed out "Task instructions can be adapted to provide opportunities for practices of the different skills your learners need: e.g., beginning with spontaneous exploratory interaction or writing individual notes or reading a text prior to doing the task, and then planning an oral (or written) public presentation of the task outcome". Such



tasks can include booking a ticket, making out a plan, or checking the stores and spare parts ordered. Assessment is basically based on appropriate accomplishment of real world tasks, rather than on accuracy of language forms. Instructors adopted the task-based language learning to directly connect to real-life situations. It has been defined that the task is an activity where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome.

TBLL consists of the pre-task, the task cycle, and the language focus. Pre-task: Introduce the topic and task instructions, getting students prepared for completing the task. Brainstorming useful topic words and phrases is an effective way of involving students in this phase. In the pre-task, the teacher will demonstrate what the students will be expected in the task phase. Task cycle: Learners use language in varying circumstances and are exposed to others using it. During the task phase, the students perform the task, typically in small groups. The teacher's role is usually an observer or a counselor—thus a more student-centred methodology. In this phase, some types of tasks can be applied, like listing, ranking, comparing or contrasting, problem-solving, and even higher demanding creative task. Language focus: Analysis and practice. Learners will focus on form and ask questions about language features.

Nunan [16] outlines the five characteristics of task-based instruction in language learning: 1. An emphasis on learning to communicate through interaction in the target language, 2. The introduction of authentic texts into the learning situation, 3. The provision of opportunities for learners to focus not only on language, but also on the learning process itself, 4. An enhancement of the learner's own personal experience as important contributing elements to classroom learning, 5. An attempt to link classroom language learning with language activities outside the classroom. Task-

based instruction is a learner-centred teaching method, providing numerous chances for the meaning-focused contextual communication-oriented negotiation.

High order thinking skills are integrated in developing tasks and questions. The implementation into learning material considers much on the underlying theories. The tasks and questions are selected based on constructivist theory which allows schema theory to apply. The theory holds that individuals use insight and their prior experiences before engaging in thinking. Meanwhile, the critical thinking process involves problem solving which is a search to relate each aspect of a problem, by identifying the causes and effects leading to a better understanding; individuals reflect on the problem and find a better solution after weighing different types of judgements. Therefore, the tasks and questions should give opportunity for the students to tackle the problem they face with different solutions and find alternative solutions using their critical thinking.

Furthermore, the theory underlays stimulation to the students' thinking in a holistic way as it encourages the learners' memory to trace the causes and effects of a problem before stipulating a solution. This holistic perspective includes schema theory, constructivism theory and information processing theory and scaffolding that contribute to enhancing ESL learners' critical thinking skills.

The underlying learning theory in the material development should support the development of HOTS. For this purpose, schema theory was selected to promote targeted mental development. The schema refers to a collection of knowledge often associated with a concept and it contains background knowledge of content, text structure and hierarchical organisation of the text. Using this as a guide, students need to possess and activate their previous schemata stored in their long-term memory



as well as obtain new knowledge through ESP material and related science-based content. Schemata supply the necessary knowledge of phrases, content and organisation forms, which have much influence on the acquiring, memorizing and understanding the material.

Furthermore, the constructed schema theory depicted the relationship of using Gestalt theory and information processing theory in developing the materials. It maps out the theoretical framework that underlies the relationships between the variables in the research that are the higher order thinking skills used in the learning materials. Gestalt theory holds that individuals use insight and their prior experiences before engaging in thinking. According to Gestalt theory, the critical thinking process involves problem solving which is a search to relate each aspect of a problem, by identifying the causes and effects leading to a better understanding; individuals reflect on the problem and find a better solution after weighing different types of judgements. In this case, the students will have to tackle the problem they face with different solutions and find alternative solutions using their critical thinking. This explains that Gestalt has an important impact on developing critical thinking skills. Not only that, Gestalt theory stimulates the students' thinking in a holistic way as it encourages the learners' memory to trace the causes and effects of a problem before stipulating a solution. This holistic perspective includes schema theory, constructivism theory and information processing theory and scaffolding that contribute to enhancing ESL learners' critical thinking skills. All of this thinking will then assist the students in portraying their thinking skills in the form of action words found in Bloom's Taxonomy.

### III. METHODOLOGY

Basically there were two steps to follow during the research. The first refers to preparation stage of the material

development. The second is about the process of developing material to accommodate requirements and characteristics which are resulted from the first step. This study is categorized as research and development which focus on the development of the English textbook for students of Shipbuilding State Polytechnic of Surabaya articulating the high order thinking skills as manifested in the tasks. The learning material to develop in the research is focused on using the higher order skills to on three skills, namely: application, synthesis and analysis.

The preparation stage collected and analysed data from students and teachers. To obtain the objective, the researchers voluntarily invited 2 English teachers and 114 students from two study programmes namely Marine Engineering and Marine Electrical Engineering as the subjects of this study. There is no selection of the respondents since the research was conducted during the English class when the whole class participate in teaching and learning process.

The data were collected through questionnaires, interview, and observation. The questionnaire was designed to get information about students' learning style. The interview was used to gain data from the English teachers related to English learning material. The results were designed to reveal the learning need and students' learning styles as the basis of the development of the English texts. The observation was used to verify the information gathered from the questionnaires as well as to assess the developed material in research. The gathered data were then analysed with the use of descriptive qualitative method.

The development stage concerns on developing the learning materials. After using all the theories to construct the module, the researchers carried out a checking on the learning material content to meet conditions of the students, teachers and the school. Teacher's content



knowledge of higher order thinking skills for teaching writing affect their instructional strategies achieved through interaction with the students and the module used. The teacher's knowledge of using HOTS in the class will influence the thinking skills. The teachers will use their knowledge of the thinking skills and teach this knowledge to the students. The accomplishment of the students depends fully on the teachers' knowledge as the teachers facilitate the students' thinking with their knowledge of teaching thinking. By using the module, students will be able to master and use different types of thinking skills provided in it.

Using the underlying theories to construct the material, the researchers also put the result of the first step's result in developing the material. After the development, the checking of the material was carried out to confirm the characteristics in relation to learners' style of learning, the teachers' needs and blending of HOTS. By using the module, students are expected to master and use different types of thinking skills provided in it.

#### IV. LEARNERS' LEARNING CHARACTERICS

In the first step of the research, it was revealed that some findings support to development of high order thinking skills that 82.5% respondent admitted that they made connection between the new input and their experience or their knowledge. It becomes a beneficial basis in developing high order thinking skills. Students were ready to experience a kind of HOTS practices. It was growing better since the fact that 75% of them would apply and practice the new input in any ways productive skills of language practice. This is hypothetically strengthening learners' readiness to develop themselves with HOTS.

In line with the findings, most English teachers also stated that the

articulation of HOTS in the English textbook could drive students to critically, analyse the use of language in a broader contexts, and implement the result of learning into another learning activity and/or actual actions involving English as a foreign language. This relies on the fact that so far the existing English textbooks designed for vocational education has only dealt with the application of low order thinking skills (LOTS), namely memorizing the language form such as sentence patterns, vocabulary, pronunciation, and the like. Such voices were also supported by teachers' responses which were obtained through interview claiming that the existing English textbooks used in the process of the English teaching and learning at vocational education articulated on memorization of the language forms such as vocabulary, pronunciation, and grammar.

The questionnaire also showed that English was used more in academic context, because the language was not used in writing notes, messages, letters and reports by more than 58% of respondents. Instead of limited usage of the language, it may give bigger opportunity to blend English with other aspects of learning such as critical thinking skills through development of HOTS and specific content of ESP. The academic atmosphere of language learning is also supported by learners' willingness to involve in a foreign language learning without trying to translate it into mother tongue which was shown by 62.5% of the respondents. This positive characteristic of learners' learning style is encouraged by learners' motivation in learning English. The motivation was supported by the facts that 82.5% learners have clear objectives of learning English, observe the learning progress, and reassure themselves to learn. Moreover, more than 90% of learners tried to be good learners of English, while 65% of total preferred practicing English with their classmates. On the other hand, the rate of anxiety is



still high which was indicated by 65% of the total respondent.

Related to development of critical thinking and language learning, all students would not stop guessing when they had lexicon problems of communication. They (100%) would try to predict the meaning. Furthermore, they (87.5%) employed gestures and hand/body movement to represent the word to say, but they forget the word in the target language. Nevertheless, all of them would use communication strategy when they were facing vocabulary problem by using other word which is similar in meaning. Their language learning was supported by their willingness to learn foreign culture or the culture of the foreign language being learned.

#### V. LEARNING MATERIAL CHARACTERISTICS

Based on the theoretical framework and the learners' characteristics, the English learning material was developed. The material should accommodate the research findings and the objectives of learning which were mentioned in learning outcomes. Items to be included in the materials embrace language skills development, high order thinking skills practice and group assignments. The language skills development incorporates with learners' motivation and tendency to use English in academic activities. The academic activities were designed to encourage the development of high order thinking skills. This requires a careful planning and selection of material presentation and assignments. The activities should also consider the learning style whose learners prefer group activities to individual ones.

The learning material is designed to come up with some strategies and activities for helping teachers to infuse higher order thinking skills to develop students' all language skills. It opens the path for teachers to explore ways of

encouraging students to express themselves creatively and critically. The objectives are to assist teachers to infuse HOTS in teaching, to promote the teaching of English using HOTS related questions, to develop skills for teaching through controlled and guided activities, to enhance student's ability to use HOTS in a variety of situations, to elicit responses from students directed to usage of higher order thinking skills, and to train students to perform unconscious critical thinking on their own. The outcomes upon completion of this module are enabling teachers to infuse HOTS in teaching writing, giving teachers a picture on how to infuse HOTS in language teaching, enabling teachers to teach effectively across the curriculum, enhancing student ability to use HOTS in a variety of situations, developing student ability to communicate in a variety of situations using HOTS, and enabling students to perform unconscious critical thinking on their own.

A few procedures were used to measure the material validity. This research looked into the face validity, content validity and construct validity of the instrument. Face validity refers to a subjective assessment done by researchers to identify the relevance of instruments in the measuring item to be relevant, reasonable and clear [17]. For this research it refers to how relevant is the higher order thinking skill material in helping the students use HOTS while writing. Sangoseni et al. [18] stated that content validity refers to whether the content of the items measured in the instrument are representative and sufficient in evaluating a situation. For this research, the content validity refers to the activities and the lesson plans in the material. On the other hand, construct validity is the degree to which an instrument evaluates what it is measuring. Therefore, for this research, the researcher made a checklist inclusive of the face validity, construct validity as well as the content validity.



The learning strategies and assignments are selected carefully to give optimum result in triggering and developing high order thinking skills. One of them is the use of graphic organisers to acknowledge students the skills. They refer to the use of a diagram to record the learners' thinking in a visual map which are said to be linked with HOTS because they promote reasoning, comparing and contrasting ideas, listing, making connections which are some of the verbs found in Bloom's Taxonomy. Learners may use more than one type of graphic organiser. They were able to use a listing mind map, a process mind map, a bubble mind map and also a disc shape mind map. For example, graphic organiser was used by the teacher for one of the activities relating information to main themes and ideas. After asking the students to discuss the ideas in their respective groups, the teacher then collected their ideas in a bigger mind map.

Another strategy to use was questioning which is proven having a positive relationship between questioning during instruction and student's factual recall and application of thinking skills based on Redfield and Rousseau's [19] result of a meta-analysis study. Questions are often classified by the level of cognitive requirement utilised to answer them. The questioning used depends on the type of answer that we want to hear. Some of the questions teachers used were open ended question, close ended questions, recall and process questions and also funnelling. Open ended questions open up room for explanation. One type of questioning skill closely linked to higher order thinking skills is funnelling. The teacher does this a lot so that the students can think the way the teacher wants them to think. After asking a question and upon receiving an answer the teacher will further question to get more insight into an idea. Throughout the lessons, the teacher kept changing from one type of questioning to another type depending on

the type of response required and also the purpose of questioning. The teachers usually began their lessons with a close ended question and then slowly move to an open ended type of question after familiarising students with the topic.

One of the components of higher order thinking skills is comparing and contrasting ideas. Comparing and contrasting ideas for the activities in the material allowed the students to identify the different perspectives among their peers and select a suitable answer after evaluating all the possible consequences. Kagan [20] supports this statement when he reviewed the process of making students process a piece of information is by having the student understand the information first and this will then allow the student to categorise, analyse, synthesise, and then apply the information. In the current study, the students could identify the relationship between two idea presented on the board. The teacher listed problems and solutions based on their responses. Students were able to identify the relationship between the problems and were able to come up with a solution and continued elaborating their idea after connecting the relationship of two ideas. They were able to apprehend that each problem had a solution. For instance in one of the activities on global warming, when there is too much deforestation that it causes global warming, the solution was either to plant more trees or have the law enforced. When the students were able to connect these concepts they were able to understand better.

Moreover, cause and effect question are also utilised to stimulate and provoke the student's critical thinking and analysis skills throughout the learning process. Cause and effect questions are also one of the techniques of infusing higher order thinking skills into writing lessons. Such questions allow students to think as they elaborate more on a situation. This kind of assignment allows the students to describe and explain the causal relationships





between actions or events from the material to develop. For students to practice thinking, they need to be active thinkers by asking questions and applying metacognitive strategies [21]. In this case, the students were able to define a problem or a dilemma and either identify its solution in the text or suggest a possible solution. This was captured when the activities required students to answer a problem solving question very closely related to their daily situation.

The next kind of assignment is reasoning which is potential to help students to think logically and sensibly. Fisher [22] claimed that teaching thinking and reasoning is the backbone in ensuring good standards among students as it is the most basic skill of the curriculum. This can be seen in this activity via two channels. First is by looking at the students' answers from the mind map. The students wrote the answers in a very distinct manner. Reasoning also helps teachers to receive more feedback on a response to see whether the students understand an idea well. In one of the module activities, the teacher questioned the students' answer from the graphic organiser drawn by them. The teacher did so to allow students to elaborate more on their answer by using why-how questions. During these activities it can be seen that students were serious with their responses and were able to provide answers related to the question. For instance, in this case the teacher moved to the next question although most of the answers given by the students were short yet precise. A successful reasoning is when a good conclusion is achieved. In this case, the teacher was satisfied with the reasoning the students provided.

## VI. CONCLUSION

English taught in polytechnic is required to cover not only specific engineering contents related to specified department and study program of the students, but also contents to give pathway

to develop high order thinking skills (HOTS). This demands a learning material to facilitate students to engage in the process of English language teaching and learning and to enable them to practice critical thinking skills. Students' mastery of English and their ability to conduct high order thinking skills are mandatory. Therefore, an integrated learning material which combines language learning and high order thinking skill practice is urgent. The development of learning material should suit with the learners' learning characteristics to ensure the helpfulness of the material to reach the learning target by accommodating students' learning style in an allocated time. Generally, the students are ready to engage in language learning and high order thinking skills development. They tend to use English in academic background, and prefer to work in groups to individuals. Their readiness is also reflected through their strong willingness to learn the culture of the target language.

In response to research objectives, the materials are selected particularly to promote HOTS development. This is manifested in selection of learning strategies. The strategies employed in the material comprise the use of graphic organiser, comparing and contrasting ideas, cause and effect questioning, and reasoning through questioning. The strategies are considered to bring high effectiveness in high order thinking skill development.

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